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[54] **TRACKING SYSTEM AND METHOD**

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[52] **U.S. Cl.** **367/130**; 367/118; 367/124

[58] **Field of Search** 367/118, 119, 367/121, 124, 129, 130, 901; 364/516

[56] **References Cited**

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[57] **ABSTRACT**

A method and apparatus for detecting, processing and tracking sonar signals to provide bearing, range and depth information that locates an object in three-dimensional underwater space. An inverse beamformer utilizes signals from a towed horizontal array of hydrophones to estimate a bearing to a possible object. A matched field processor receives measured covariance matrix data based upon signals from the hydrophones and signals from a propagation model. An eight nearest neighbor peak picker provides plane wave peaks in response to output beam levels from the matched processor. A five-dimensional M of N tracker identifies peaks within the specified limit of frequency, bearing change over time, range and depth to specify an object as a target and to display its relative range and depth with respect to the array of hydrophones.

20 Claims, 6 Drawing Sheets